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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/831,567	05/10/2001	Gerhard Gille	MO-6323/STA-	6933
157	7590	10/04/2005	EXAMINER	
BAYER MATERIAL SCIENCE LLC 100 BAYER ROAD PITTSBURGH, PA 15205			WILKINS III, HARRY D	
			ART UNIT	PAPER NUMBER
			1742	
DATE MAILED: 10/04/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/831,567

Applicant(s)

GILLE ET AL.

Examiner

Harry D. Wilkins, III

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 10-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 13 September 2005 has been entered.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alonso et al (XP-000874467) in view of Polizzotti et al (US 4,851,041) and Felten et al (FR 2,294,133).

Alonso et al teach the invention substantially as claimed. Alonso et al teach (see abstract) a method of forming tungsten carbides that includes gas-phase carburization of tungsten precursor compound (tungsten trioxide) at temperatures of 700-1100°C, which overlaps the claimed temperature range of 850 to 950°C. The examples disclosed by Alonso et al contain 39, 22 and 0% CO<sub>2</sub>. Though Alonso et al do not teach that the CO<sub>2</sub> content is above the Boudouard equilibrium content, based on the

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disclosure in the specification in Example 1 (page 8), 3% CO<sub>2</sub> is above this value, thus, 39 and 22% are also above the Boudouard equilibrium content.

However, Alonso et al do not teach that the carbon activity is between 0.4 to less than 1.

The specific examples disclosed by Alonso et al have carbon activities, calculated from Applicant's formula on page 3 of the specification, that are 0.026 (61 wt% CO), 0.077 (78 wt% CO) and essentially infinity (100 wt% CO). Thus, Alonso et al teach a broad range for the CO content, which relates to a carbon activity that encompasses the claimed range.

Polizzotti et al teach (see abstract, figures 1 and 2 and col. 4, line 66 to col. 6, line 3) a tungsten carburization process at 850°C, wherein the carbon activity is controlled. Polizzotti et al teach that at  $a_c$  above 1.0 free carbon is formed. Polizzotti et al teach that at  $a_c$  below approximately 0.35 phases other than WC are formed.

Therefore, it would have been obvious to one of ordinary skill in the art to have selected a carbon activity below 1.0 to have avoided formation of free carbon and above approximately 0.35, such as 0.4, to have avoided the formation of any undesirable phases as taught by Polizzotti et al.

[It is noted that Polizzotti et al teach a Co-WC composite powder, however, nothing in the present claims excludes the presence of cobalt, and, as evidenced by figure 2, the cobalt does not participate in the carburization process at the claimed carbon activity.]

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Alonso et al do not teach that after the powder is carburized, it is subjected to a heat treatment at 1150-1800°C.

Felten et al teach (see page 2) that the reaction  $\text{WO}_3 + 4\text{C} \rightarrow \text{WC} + 3\text{CO}$  proceeds at 1200-1500°C. Thus, if treated at this temperature, any  $\text{WO}_3$  would be converted to WC.

Therefore, it would have been obvious to one of ordinary skill in the art to have heat treated the powder of Alonso et al at 1200-1500°C as claimed as suggested by Felten et al in order to ensure that any remaining unreacted precursor  $\text{WO}_3$  after the process of Alonso et al would have been converted to WC.

Regarding claim 11, see above discussion of carbon activity.

Regarding claim 12, Alonso et al teach (see page 145) that powders are produced at 900 and 1100°C and are shown in Figure 8. Therefore, Alonso et al teach that the carburization occurs at 900°C.

Regarding claim 13, Alonso et al teach (see abstract) that the carburization treatment time is 6 hours.

Regarding claim 14, Alonso et al teach (see abstract) that the precursor material is tungsten trioxide ( $\text{WO}_3$ ).

### ***Response to Arguments***

4. The declaration under 37 CFR 1.132 filed 13 September 2005 is insufficient to overcome the rejection of claims 10-14 based upon Alonso et al in view of Felten et al as set forth in the last Office action because: the comparison example at a carbon activity of 0.35 does not demonstrate bad results. The treatment was performed for 8

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hours, however, there is no time limitation in the present claims. Applicant even states in the declaration that the reaction was not yet complete in the time frame during which the test was conducted. Thus, Applicant has failed to show that below a carbon activity of 0.4 does the process produce inferior products, merely that the reaction takes longer. It is noted that Applicant has demonstrated unexpected and superior results over Alonso et al based on the other end point of the claimed range, namely a carbon activity below 1.0. The data in the declaration show that when the carbon activity was above 1.0 (such as 1.03 and 1.11), that carbon black was formed. Such carbon black would be detrimental to the formation of the pure tungsten carbide. However, as discussed below in paragraph 6, such result was fully expected based on the teachings of Polizzotti et al (US 4,851,041).

5. Applicant's additional arguments filed 13 September 2005 have been fully considered but they are not persuasive. Applicant's additional arguments are deemed to be cumulative to the arguments of record. These arguments are not found persuasive for reasons already of record and the new grounds of rejection presented with further the teachings of Polizzotti et al.


### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D. Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-F 8:30am-5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Harry D Wilkins, III  
Examiner  
Art Unit 1742

hdw

  
ROY KING  
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